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PORK

ON THE FARM

Killing, Curing,
and Canning

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WARM, freshly slaughtered pork carcasses should be chilled to a temperature between 34° and 40° F. within 48 hours, preferably within 24 hours, after slaughtering. Bacteria which may cause spoilage if their growth is not promptly checked by chilling are often present in the meat.

Meat as it cures will normally develop a more uniform, desirable flavor if it can be held at an even temperature of about 38° F. On the farm, temperatures are not easily controlled, but every effort should be made to approximate those mentioned.

Proper slaughtering equipment will make it possible to clean hog carcasses thoroughly so that full use can be made of all the parts, including the head and feet.

Sausage, scrapple, headcheese, and similar products afford means of utilizing certain parts of a hog carcass that might otherwise be wasted.

Clean, well-cut, smoothly trimmed meat can be cooked and used to better advantage than pieces that have been soiled or improperly prepared.

PORK ON THE FARM

Killing, Curing, and Canning¹

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Bureau of Animal Industry*

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IMPORTANCE OF PROPER METHODS

SINCE FRESH MEAT is highly perishable, proper handling is necessary to make it into sound and palatable products that will keep satisfactorily. Only through the elimination of waste and spoilage can the advantages of dressing hogs on the farm be realized. Success in preparing meat depends upon strict attention to the methods used. None of the details of these methods are difficult, but all are important.

There are many different ways in which to prepare pork products. The most desirable one for each farmer is that which best suits his family or locality. However, certain general rules for cutting and curing should be observed by all.

EQUIPMENT

Elaborate and expensive equipment is unnecessary, but certain tools are essential and others are very desirable (fig. 1). Most useful of all is the curved 6-inch skinning knife. It may be used for sticking the hogs, raising the gambrel tendons, shaving and dressing the carcass, and cutting and trimming the meat. It is also the best knife for skinning cattle and lambs. Once the user becomes ac-

¹ This is a revision of a previous edition written by F. G. Ashbrook, junior animal husbandman, and G. A. Anthony, lay inspector, Bureau of Animal Industry, and Frants P. Lund, Division of Cooperative Extension.

customed to its shape, the curved knife will be found to cut more easily and smoothly than the straight butcher knife. A narrow-bladed boning knife, the narrower the better, is needed in preparing boneless roasts and boning meat that is to be made into sausage or canned.

In sharpening a knife a grindstone commonly is used first. With it an even bevel, about one-fourth inch wide, is put on each side of the blade. An oilstone is used to give a smooth, keen edge. A smooth, high-quality, 9- to 14-inch steel is used to keep a sharp knife in good cutting condition. A smooth steel straightens the edge of a sharp knife or removes the "set" from the microscopic teeth that compose the edge. When they are purchased, most steels, even those of high quality, are too rough to be serviceable and should be rubbed down with an emery stone until the surface is smooth and glassy. One can form the habit of steeling the knife briefly but frequently while using it.

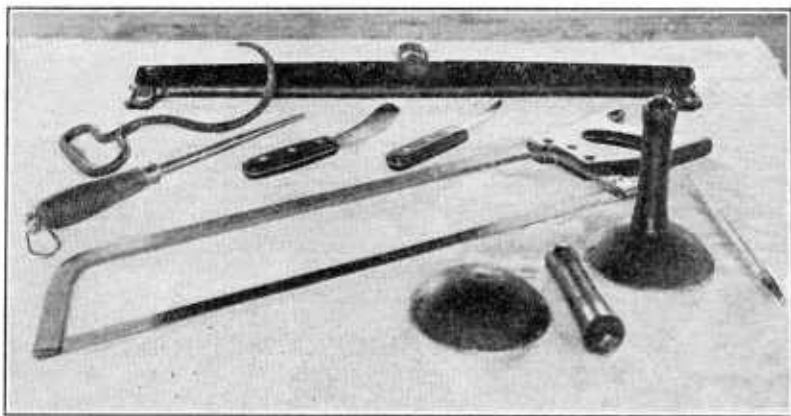


FIGURE 1.—Equipment for use in slaughtering and dressing hogs: Gambrel (singletree), hook, smooth steel, skinning knife, boning knife, saw, bell-shaped hog scrapers, and thermometer.

The meat saw should be 24 to 28 inches long. A saw of this length can be used instead of a cleaver for splitting either hog or cattle carcasses. The bell-shaped hog scrapers are the best hand instruments yet devised for removing the hair, scurf, and dirt. A fairly heavy steel scraper, with a bell that will take a rough edge on the outside when rubbed with an emery stone or file, is the most efficient. A scraper 4 inches in diameter can be used more easily than larger sizes, whereas smaller scrapers are usually too light and do not hold their shape. A clean singletree with open hooks makes a more desirable gambrel for hanging the carcass than the customary notched stick as there is less danger of the carcass slipping off the singletree. When many hogs are to be killed, the use of commercial metal gambrels is suggested.

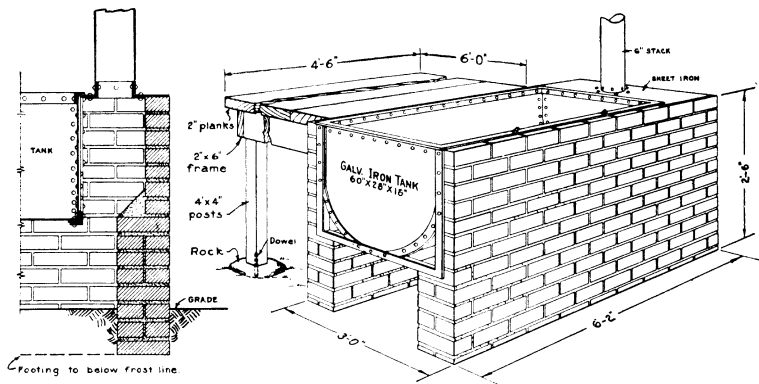
A 50-gallon hardwood or metal barrel will serve to scald a hog weighing up to 250 pounds, without much difficulty. A metal trough or watering tank 5 to 6 feet long, 30 inches wide, and 15 to 24 inches deep may be converted into a combination water heater and scalding vat. It is set up on bricks or put over a trench. The sides are banked with earth and a fire built beneath (fig. 2). This arrange-

ment permits holding the temperature of the water at the proper point for scalding any number of hogs.

The most convenient scraping table is $4\frac{1}{2}$ feet wide, $2\frac{1}{2}$ feet high, and 4 to 8 feet long (fig. 2). On a table of this width the hog can be laid crosswise so that one man may scrape the rear end while the other scrapes the head. A thermometer that will register up to 212° F. is desirable so that the temperature of the water can be correctly gaged.

A hog or hay hook for use in scalding the animal; pans or tubs for holding edible and inedible viscera; a block and tackle, ladder, rack, or other means for suspending and chilling all the carcasses that are to be dressed; and plenty of hot and cold water should be provided before operations begin. A small blowtorch and wire brush will help materially in singeing and scrubbing the head and feet.

A salinometer (known also as a salimeter), operating on the same principle as the wet-battery hydrometer, may be used in measuring



SECTION THROUGH SMOKE CHAMBER

PERSPECTIVE

FIGURE 2.—Combination water heater, scalding vat, and scraping table. The tank may also be set on the ground over a trench and banked with sheet metal or earth.

accurately the saltiness of the curing brine. It is inexpensive, and may be obtained at any butcher's supply house.

MEDIUMWEIGHT HOGS MOST DESIRABLE FOR SLAUGHTER

A hog weighing from 180 to 225 pounds alive will produce moderate-sized cuts and usually a very desirable proportion of fat and lean. Heavier hogs will produce more lard.

When hams and shoulders are cut according to the methods later described, each will weigh about 7 percent of the live weight of the hog. Each bacon strip and loin will weigh about 5 percent and the head 7 percent. The weight of lard rendered from a 200-pound live hog will range between 9 and 13 percent of the live weight of the hog; and that from a 250- to 300-pound hog, between 14 and 18 percent.

A smooth, moderately well-finished hog will usually produce a desirable quality of meat. Of course the animal should be thrifty, and healthy and the meat suitable for human consumption.

CARE OF THE HOG JUST BEFORE SLAUGHTER

The care of an animal just before it is slaughtered has much to do with getting a good "stick." This is very important because meat from a well-bled hog keeps better than that from a hog which has not bled well. A hog bleeds more thoroughly and dresses more easily after a 24-hour fast, but it should be given all the water it will drink. Running the animal or wrestling with it often causes a temporary fever. If the animal is killed in this condition, the meat is likely to be bloody, sometimes referred to as fiery. Such meat looks bad and spoils easily. Bruises and whip marks cause bloody spots, which must be trimmed out. Penning the animal by itself the day before butchering is recommended.

STICKING

Killing the hog should be done as humanely as possible and in a way that will insure a thorough drainage of the blood. Putting the hog in a small pen the day before will make it easier to stun or catch without exciting it. Stunning may be done by striking one sharp blow with the head of an ax or other heavy blunt instrument or by shooting at a point in the forehead midway between the eyes and slightly above. Improperly placed blows or bullets that do not stun can cause the animal much pain. If stunning is practiced as a humane measure, take care that the first attempt is successful. Since bullets sometimes glance from a hog's skull or miss, care should be taken to prevent injury to persons or to other livestock.

If the animal is stuck without being stunned, the blood will drain out more completely than if it is stunned first. Shackling a hog's hind leg with a chain or rope and hoisting it by a block and tackle fastened securely some 10 feet above the ground is the easiest way, for both man and hog, to restrain the animal for sticking without stunning. To get the hog in proper position for sticking on the ground, reach under the animal and grasp its opposite front leg, then roll it upon its back and hold it firmly by the front feet. The man holding the hog stands astride it, facing forward, with his feet and knees pressed against the shoulders of the animal to prevent it from rolling (fig. 3).

The following sticking method is recommended for the beginner. The man doing the sticking takes a position squarely in front of the hog, holds down the snout, and opens the skin for a distance of about 3 inches in front of the breastbone. He then inserts the knife, edge downward, straight in toward the breastbone, not downward as is often done. When the breastbone is reached, he follows downward with the point of the knife until the knife slips under the breastbone and between the ribs. He then pushes the knife in about 1 inch and directs the cut first downward toward the backbone, then forward toward the head (fig. 4). Care should be taken to hold the animal squarely on its back and to keep the knife in the center so as not to stick a shoulder. It is both difficult and unwise to stick the heart. Let it pump out the blood as long as possible.



FIGURE 3.—Sticking the hog. Note that the feet of the man holding the hog are pressed against the shoulders of the animal to prevent its rolling.

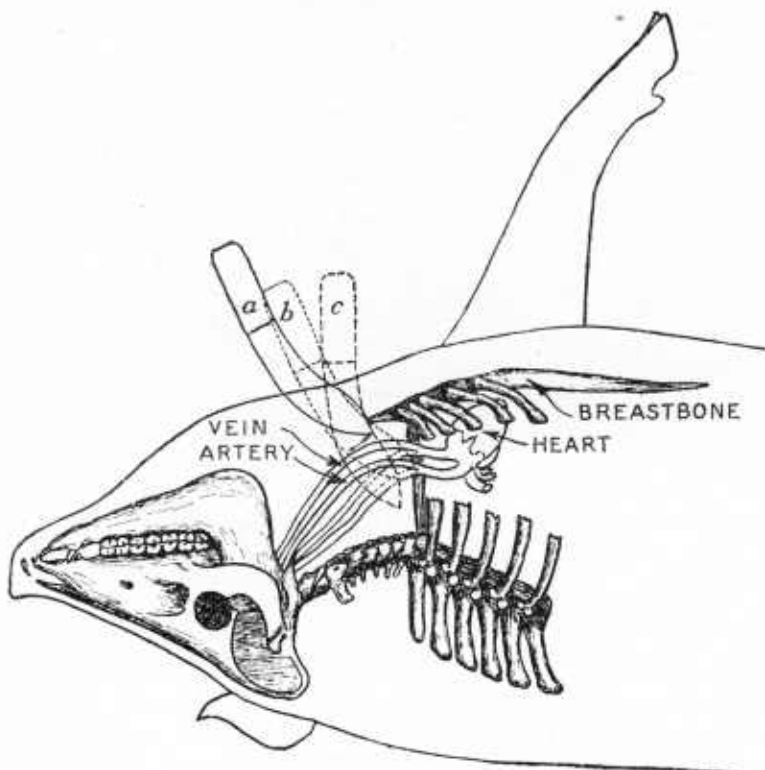


FIGURE 4.—The three positions of the knife in sticking a hog : *a*, The knife inserted in the fat ; *b*, the second position places the knife above the artery ; *c*, the final position, after the downward thrust has been made and the artery severed.

SCALDING

Slow scalding is usually best. At slaughterhouses where steam is available to maintain the scalding water at a steady temperature, the water is usually held at 140° to 144° F. With these temperatures it will take from 3 to 6 minutes to loosen the hair and scurf, but there is little or no danger of setting the hair or cooking the skin. In the fall of the year when the winter hair is beginning to grow and most



FIGURE 5.—Scalding the hog. Keeping it in motion lessens the danger of setting the hair and works the water into the wrinkles of the skin.

hogs are difficult to scald, temperatures as high as 146° to 150° are sometimes used.

On the farm, where it is difficult to reheat the water promptly, temperatures of 155° to 165° often must be used at the beginning so that the water will not become cold before the hog is completely cleaned. In using water as hot as this, care must be taken to keep the hog in motion (fig. 5) while in the water and to pull it from the barrel and give it frequent chances to cool. This lessens the danger of setting the hair. If possible, it is advisable to have plenty of boiling water available so that lower temperatures can be used at the beginning and more hot water added if necessary. The combina-

tion heater and scalding vat shown in figure 2 is the most convenient means for obtaining the proper temperature.

Lime, rosin, or other substance that will make the hair cling to the scraper and pull out more easily is often put into the water. The proper temperature of the water, however, is more important than any substance that can be put into it.

Twenty-five to thirty gallons of water is ordinarily enough to scald a hog in a 50-gallon barrel. Lightweight or mediumweight hogs can be practically immersed in the barrel. The animal is held with a hook in the lower jaw. In scalding large hogs the ham end of the animal is immersed first and then the head end. When the latter end is immersed, one leg of the hog is held with the hook caught in the gambrel tendon. At this time, a third man, if available, can remove most of the hair from the hot legs and flanks even though the animal is kept in motion.

SCRAPING

When the hog is completely scalded, turn it crosswise on the table. One man should grip the hind legs with both hands and twist off the hair, then pull off the dew claws and toes, while



FIGURE 6.—In scraping the carcass tilt the scraper on its far edge and pull forward. Use both hands and plenty of pressure.

hot, with a hook, and scrape the hindquarters (fig. 6). Another should scrape the hair from the forequarters, feet, and head. After some experience, one will learn to stretch the skin by moving the leg or head so as to smooth the wrinkles and make scraping easier. If patches of hair have not been thoroughly scalded, it is often possible to loosen them by covering them with sacks or hog hair and pouring hot water on them. The dehairing of the hot carcass should be done as rapidly as possible as there is a tendency for the skin to "set" and render the removal of the hair difficult.

After the hair and scurf have been scraped off, much of the dirt can be removed by rinsing the carcass with warm water and pressing the bell scraper flat against the carcass instead of tipping it on its

edge as before (fig. 7). A blowtorch and wire brush will now be very useful in singeing and scrubbing the head and feet (fig. 8).



FIGURE 7.—To remove the dirt, press the scraper flat against the wet skin and move it rapidly back and forth. This creates a suction that will remove much dirt and stain.

hook engages both tendons. After the gambrel is raised and the carcass is suspended, wash the carcass again with cold water and shave it again.

REMOVAL OF INTERNAL ORGANS

Opening a hog carcass and removing the internal organs are really very simple operations, particularly if the animal has been kept off feed for 24 hours before slaughter. There are many different methods, but the following should be easily understood by the beginner.

Insert the skinning knife, edge up, into the sticking place and cut up through the full length of the

breastbone (fig. 11). If the breastbone is very hard to cut, as it may be in older hogs, the cut may be made a little to one side of the mid-

The scraped, singed carcass is ready to be rinsed with cold water and shaved (fig. 9). Wash and shave the entire carcass. It is now ready to be hung up. To insert the gambrel, open the skin at the center of the hind leg just above the foot and directly over the tendons. Push the skin aside with the knife and cut down to the bone at the side of the tendons, as shown in figure 10. Make a similar cut on the other side of the tendons. Put the knife aside and raise the tendons with the fingers to receive the gambrel. Be sure the gambrel or



FIGURE 8.—Cleaning the head. The head is scraped and singed and then scrubbed with the wire brush.

dle where there is softer bone or cartilage. It is sometimes necessary to use the saw. Care should be taken not to extend the opening incision upward beyond the chest cavity. To do so will cut into the stomach or allow the intestines and stomach to protrude and interfere with the operation to follow.

Now begin at the other end of the carcass and cut down between the hams, taking care to keep the knife in the center. As the hams open, the white membrane which marks the exact middle can be seen. Follow this, if possible, to the pelvic bone. If one misses the middle "seam," correction may be made by a small bony projection that can be felt with the finger just underneath the front (forward side) of the pelvis. If the knife is



FIGURE 9.—In shaving the animal, stretching the ears, jowls, legs, and other parts will smooth out the wrinkles and make shaving easier.

directly above this projection, there is usually little difficulty in separating the hams correctly. Use the saw if necessary to divide the

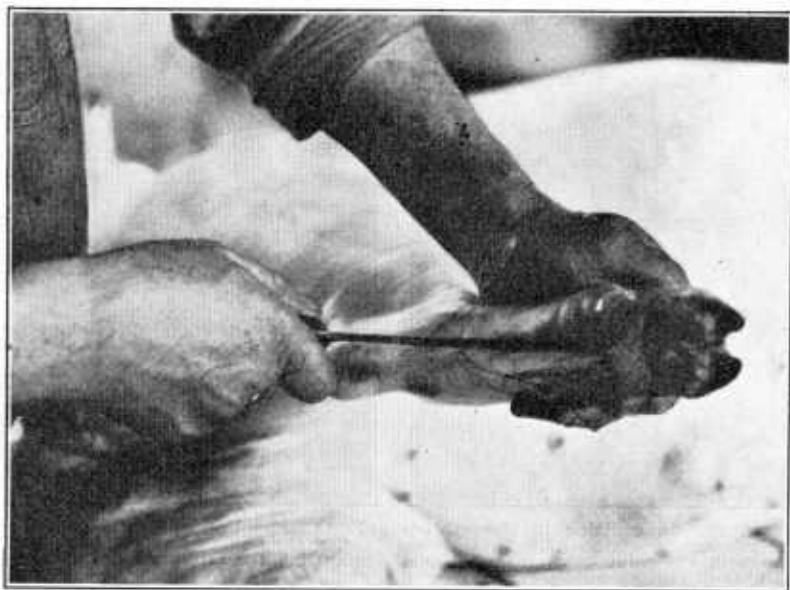


FIGURE 10.—Raising the gambrel tendon.

pelvic bone. While dividing this bone care should be taken to avoid puncturing the urinary bladder which lies just below. In dressing a

barrow, loosen the penis and let it hang, to be removed later with the bung. Insert the handle of the knife in the opening made in splitting the hams, with the point of the knife pointing outward.



FIGURE 11.—In splitting the breastbone, if the handle of the knife is slanting up with the point down there is little danger of cutting up too far and opening the stomach.



FIGURE 12.—Under this method of opening the carcass there is no danger of cutting the intestines or stomach.

Guard the heel of the blade with the forefinger and thumb of the right hand and cut down the median line of the belly until this cut joins the split breastbone (fig. 12).

Allow the intestines to roll out and hang by their natural attachments. Raise the bung by slipping the knife into the pelvic cavity and loosening the bung from the fat on both sides and at the back.



FIGURE 13.—The internal organs will not fall unless the animal was fed shortly before slaughter.



FIGURE 14.—In removing the intestines, grasp them carefully and firmly so they will not tear and fall.

Pull it down toward and past the kidneys. Be careful to cut it free from the kidney fat (fig. 13).

It is at this point that many inexperienced farm butchers expect to encounter trouble. The operation, however, is almost complete, and no difficulty need be anticipated. With the left hand grasp the

intestines firmly just below the kidneys at the point where they appear to be attached to the backbone. Push down slowly but firmly until they loosen from the back. Free the liver by running the fingers of the right hand behind it and pulling it away from the back. Still holding the intestines in the left hand, cut through



FIGURE 15.—The warm leaf fat is pulled out by loosening it at the rib end and fisting it up and out.

the diaphragm to the backbone (fig. 14). Extend the cut around the white fibrous portion of the diaphragm, which is parallel to the ribs, to the breastbone and down the breastbone to the throat. This last cut loosens the heart and lungs in the chest cavity. Still holding the intestines with the left hand, repeat the cut on the left side of the carcass, crossing the right hand over the left. It may sometimes be necessary to cut the back artery from the backbone, thus permitting the left hand to pull the entire offal out of the carcass. The gullet is still attached to the throat, but one cut of the knife will free it.

The body cavity should be washed and rinsed in cold water before the carcass is split. Splitting with a saw down the center of the backbone is recommended. This eliminates the savory country-style backbone piece or chine but gives a larger quantity of meat suitable for curing and canning.

The split carcass will chill more rapidly if the leaf fat is pulled out by loosening it where it is attached to the diaphragm at the last rib and stripping or fisting it up and

out (fig. 15). It is also much easier to remove the leaf fat when the carcass is hot than after it has been chilled. In commercial practice, where carcasses are inspected, the head of the hog is unjointed before the carcass is opened. This operation requires a little skill but is readily learned. A cut is made about

one-half inch above the ear, at right angles to the backbone, and clear through the left jowl and top of the neck and throat. The left ear is held with the left hand, and the cut is made in to the backbone. This leaves the head hanging by the bone and right jowl. The cut should meet the neck joint where the first neck bone joins the head. The dished "button" end of the backbone fits over the head end of the joint in the same manner that the fingers and palm of one hand can be made to enclose the clenched fist of the other. The knife loosens the membranes at the lower or head end of the joint, the end of the "fingers" of the upper or enclosing "hand." As the joint opens, the knife moves upward along the "knuckles" of the clenched "fist," across its top, and down the far side. The whole joint is about $1\frac{1}{2}$ inches wide. Packers often unjoint the head by cutting across above the ears, peeling off the jowls, and allowing them to remain upon the carcass.

CHILLING THE CARCASS

The tissues of many freshly slaughtered hog carcasses contain bacteria that are capable of spoiling the meat unless their growth is promptly checked. Packers have practically solved the problem of sour meat by chilling the fresh, warm carcass to a temperature of 34° to 36° F. within 24 hours after slaughter and by holding the meat at 36° to 40° while it is curing. On the farm, butchering should be done when the weather is as favorable as possible. When necessary protect the freshly slaughtered carcass from freezing by hanging it in a shed or wrapping it with a sheet; but storing the warm meat at high temperatures, particularly those above 40° , is often the cause of spoilage.

Unless care is taken the fat bellies and hams of warm, freshly slaughtered hogs often overlap each other during the cooling process, thus closing the body cavity to air circulation. Warm hogs, so hung, will frequently show spoilage the next day, even when held at low temperatures. Slight taint is often observed along the bacon strip when the hot, heavy, leaf fat is not removed. It is always wise to split warm hogs and to pull the leaf fat as soon as the internal organs have been removed.

Whole or half carcasses should be suspended to chill so that they do not touch. When hams touch each other, chilling is often delayed too long, and spoilage occurs. If warm carcasses are held at temperatures slightly above freezing overnight, the internal temperature of the hams will not always be below 40° F. the next morning. Cuts from such meat should be spread out during the second night to permit complete chilling. The need for prompt and thorough chilling of warm carcasses cannot be overemphasized.

Many communities in the South have access to local cold-storage plants with facilities both to chill the carcass and to store the curing meat. The warm sides are brought in immediately after slaughter, and the owner returns 1 or 2 days later to cut the pork and put the meat in cure in the drawer, box, or bin assigned to him. The fresh cuts, fat for rendering into lard, etc., are taken home. In some cases the cold-storage company does the cutting. When nights are fairly cool the hogs are often dressed in the afternoon and allowed to hang overnight. The meat is cut and trimmed the next

morning and the curing pieces taken to cold storage. Where a community cooperates with a cold-storage plant, nominal charges to the farmers can often be obtained.

If the weather becomes warm and no cold storage is available, the warm sides may be cut up and the individual pieces hung up to air and cool, or packed in cracked ice ($1\frac{1}{2}$ pounds of ice per pound of meat). Sometimes insufficiently cooled pieces are salted lightly with a dry-cure mixture and spread on a rack where they will have as much ventilation as possible. None of these methods are as safe or as satisfactory as storing the meat at the proper temperature, either natural or artificial.

CARE OF THE INTERNAL ORGANS

The liver should be cut free and the gall bladder removed. The small, upper end of the gall bladder can be lifted with the thumb and finger and the bladder peeled out. The heart is cut off through the auricles or "ears." The tongue is removed at its base. All three parts should be washed promptly in clean water. They may be chilled in cold water and hung up for further chilling and drying. The caul fat can be separated from the stomach with the

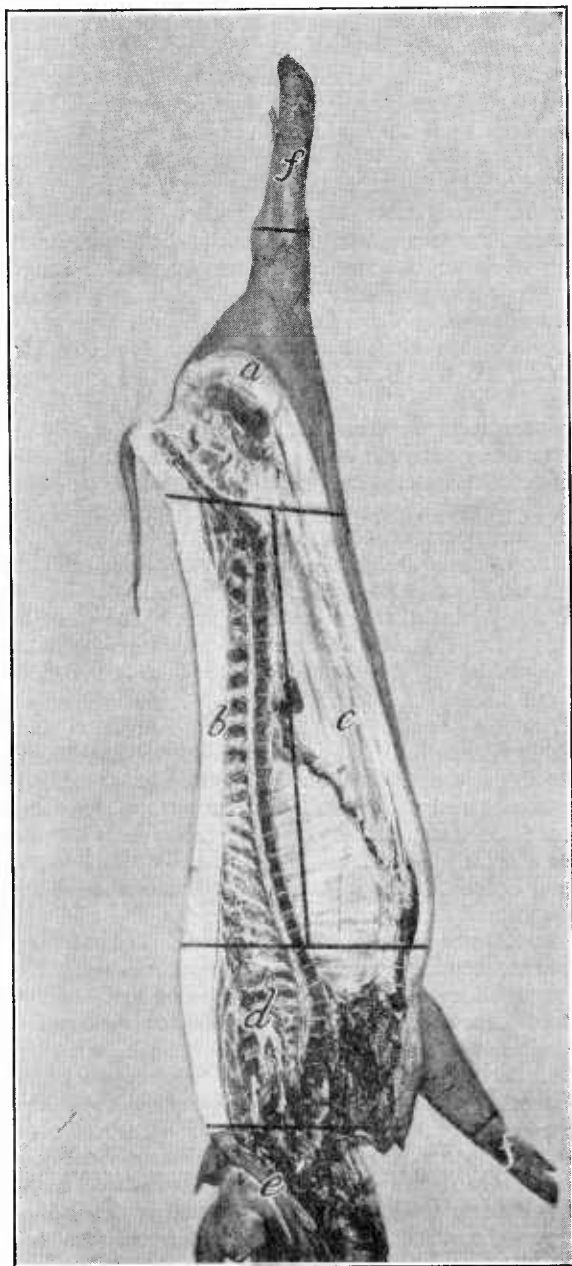


FIGURE 16.—Cuts of pork: *a*, Ham; *b*, loin; *c*, bacon strip; *d*, shoulder; *e*, head; *f*, feet.

hands. The small intestines are removed or “run” from the ruffle fat by pulling the fat in one direction with the right hand and the intestines in the opposite direction with the left. The ruffle fat is then peeled off. This fat, if not fouled in dressing, should be saved for



FIGURE 17.—Removing the three-rib shoulder.

lard. It should be thoroughly washed and promptly chilled in cold water. After being chilled, it is hung up to drain and dry before being rendered.

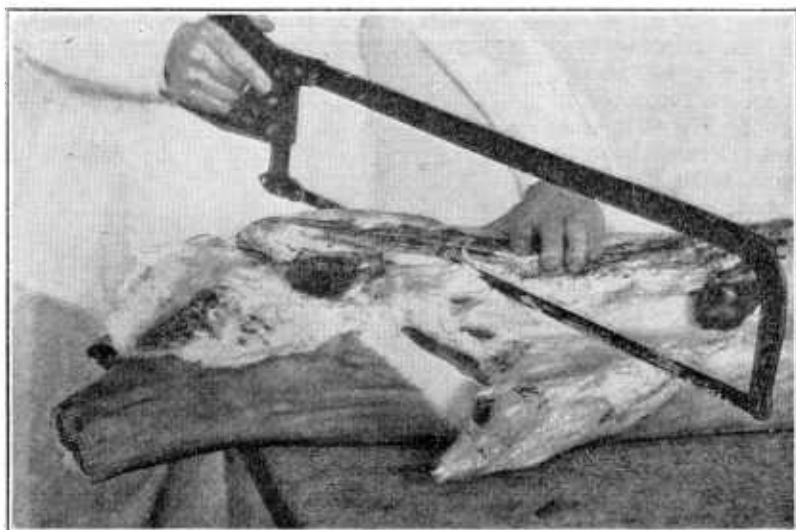


FIGURE 18.—In cutting off the square-top ham, saw at right angles to shank.

CUTTING THE CARCASS

There is no one best method of cutting a pork carcass. The choice depends on how the pork is to be used. If it is to be sold, the cuts should conform to local preferences. If the meat is to be preserved

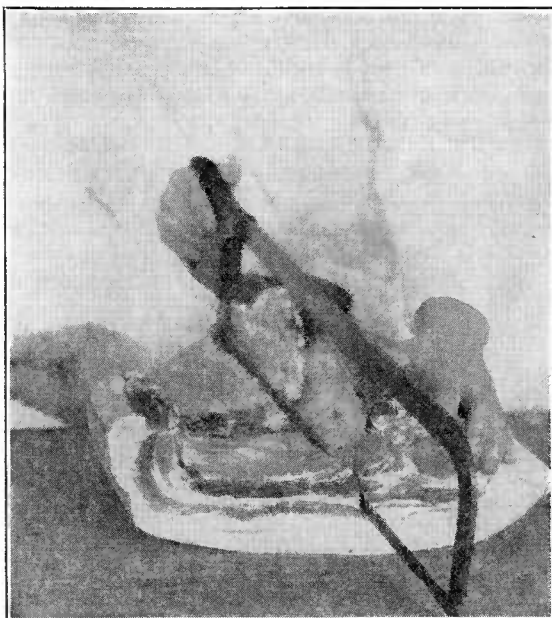


FIGURE 19.—In sawing the loin from the bacon strip, cut and saw through the leaf lard if it was not pulled off when warm.

by freezing, each piece should be of a size and character suitable for convenient cooking. The purpose of the method described here is to produce the maximum quantity of meat that can be cured and stored for summer use and the minimum number of parts that must be used fresh (fig. 16). This cutting method separates the thick ham, loin, and shoulder from the thinner bacon strip, fat, and head.

If the head was not removed in dressing, lay the carcass on its side and cut off the head about one-half inch behind the ears.

Cut to the bone and

entirely around it. The head may then be twisted off at the neck joint.

If the carcass was not split when warm, it is an easy matter to split it after it has cooled. Place the cold carcass, with the head removed, upon its back with the hams extending beyond the table. Stand between the hams, and start the saw through the forward or shoulder end of the backbone. Saw from the inside toward the skin. As the shoulders are split, the two sides will spread apart, permitting more freedom in sawing the loin and last the hams.

A three-rib shoulder is removed by sawing between the third and fourth ribs parallel to



FIGURE 20.—Removing the back fat from the loin. One-fourth to one-half inch of back fat is usually left on the loin.

the head cut (figs. 16, *d*, and 17). A long ham is cut off just behind the rise in the pelvic arch and at right angles to the direction of the hind leg. The more popular short ham is cut through the second vertebra behind the rise. To make the desirable square-top ham, the saw should be at exact right angles to the shank (figs. 16, *a*, and 18).

Cut the thick loin (fig. 16, *b*) from the thin bacon strip (*c*) just below the curve in the backbone at the shoulder end and at the edge of the tenderloin muscle at the ham end. Lay the middle, skin side down, and saw across the ribs, as shown in figure 19. Remove the back fat from the loin by cutting down the side of the loin, as shown in figure 20, then raise the fat and loosen it down the center. There are three kinds of chops cut from the pork loin: Those from the shoulder end, the center cuts, and chops from the ham end. The whole muscle of the loin can be easily boned out for sausage or for canning. Unboned, it is suitable for chops and roasts. It may also be given a mild cure.

If the leaf fat is still on the bacon strip, cut it free along the rib end, loosen it by bending the bacon strip over the edge of the table, and then pull it out (fig. 21). In removing the spareribs the edge of the knife is kept against the ribs. This will leave most of the meat on the bacon strip (fig. 22).

The jowls may be cut from the head, trimmed, and cured. After the eyes, nasal passages, teeth, and incompletely cleaned parts of the ears and snout have been removed, the rest may be used with the liver, heart, and tongue for cooked products.

The lean in all trimmings should be saved for sausage. A proportion of two-thirds lean and one-third fat is the popular combination. Many persons prefer to remove the skin from the fat (fig. 23) before cooking the lard as the fat alone renders more satisfactorily. If the skin is clean, however, it need not be removed.

PICNICS AND SHOULDER BUTTS

The trimmed three-rib shoulder may be divided into a shoulder butt, a picnic (shoulder with much of the butt removed), and plate, if desired (fig. 24). The top third of the shoulder is cut off as the butt, the extra fat or plate being removed from the lean butt. This 2- to 4-pound butt makes a very acceptable fresh roast. If the butt is to be cured, the end of the shoulder blade is ordinarily removed and the boneless piece cured with the bacon. The plate may be cut up for lard or cured as salt pork with the fat back. The picnic or remaining shank end is trimmed or rounded evenly and cured with the hams and shoulders.

TRIMMING PORK CUTS

All meat to be cured should be trimmed smoothly and evenly. Care should be taken to remove all blood spots, to be looked for especially in the shoulder. The brisket and ragged neck pieces should be cut from the shoulder, the tail and flank from the ham, and the uneven edges from the bacon strip. Leave some fat as protection on the face or inside of the ham. Excess fat on hams and shoulders may be removed, though the pieces will store more satisfactorily in summer if not skinned. The bacon strip should be flattened out with the hands or with the side of a cleaver, and



FIGURE 21.—Bending the untrimmed bacon strip over the table edge to loosen the cold leaf fat.

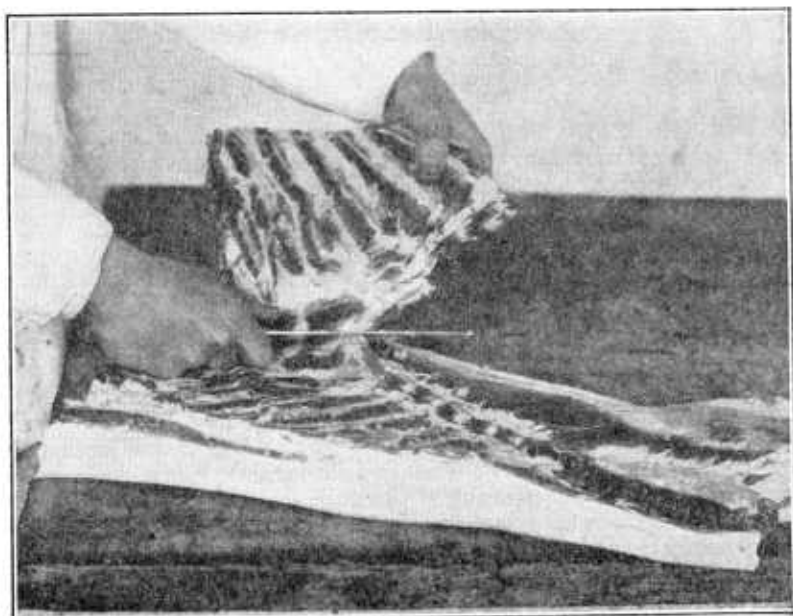


FIGURE 22.—Removing the spareribs from the bacon strip.

squared on all four sides. The jowls and fat backs, if these cuts are to be cured, should be treated in the same way. Spareribs and loins may be given a light cure without further trimming. Figure 25 shows the difference between poorly trimmed and properly trimmed hams, bacon, and shoulders.

FREEZING PORK

The widespread distribution of electric power and the development of so-called freezer-locker units (often referred to as refrigerated



FIGURE 23.—In skinning the fat trimmings, keep the knife parallel with the table and the edge turned slightly downward toward the skin.

lockers) have made subfreezing temperatures increasingly available to families interested in preserving farm-dressed pork. These units consist of individual compartments installed in a large room of a cold-storage plant. The compartments are made with wire-mesh sides or some material allowing free circulation of cold air. The doors of the compartments are fitted with locks so that each person may keep his products under lock and key.

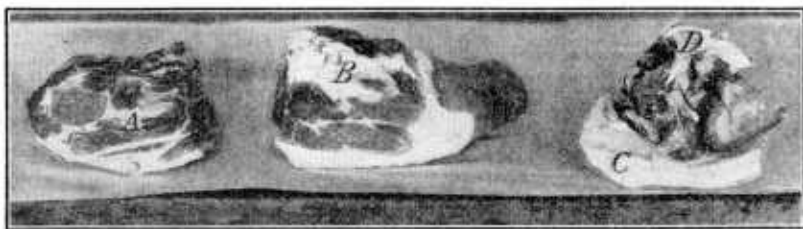


FIGURE 24.—A, Shoulder butt; B, picnic; C, plate; D, trimmings.

Freezing temperature is entirely practical for holding fresh pork though there are some definite limitations. The preserving effects of subfreezing temperatures include (1) killing or stopping the development of molds, yeasts, and bacteria, (2) reducing the activity of the enzymes, thus delaying autolysis or self-digestion, and (3) retarding chemical changes such as dehydration and oxidation. Although there is little microbial action under freezer storage, the development of undesirable textures, colors, odors, and flavors is common. These changes are attributed to the continuing action of the enzymes, evaporation of the surface ice, and other actions.

Ten degrees below 0° F. is generally accepted as the preferred temperature for the "sharp" freezing of meat products. Although 0° is the recommended level for storing frozen meat, 10° is often used and should be satisfactory if the lower one is not practical. Temperatures above 10° are, in general, too high. Much variation in temperature is undesirable.

Chilled pork should be cut into family sized pieces and well wrapped in tough, moistureproof paper before freezing. Cheap oiled

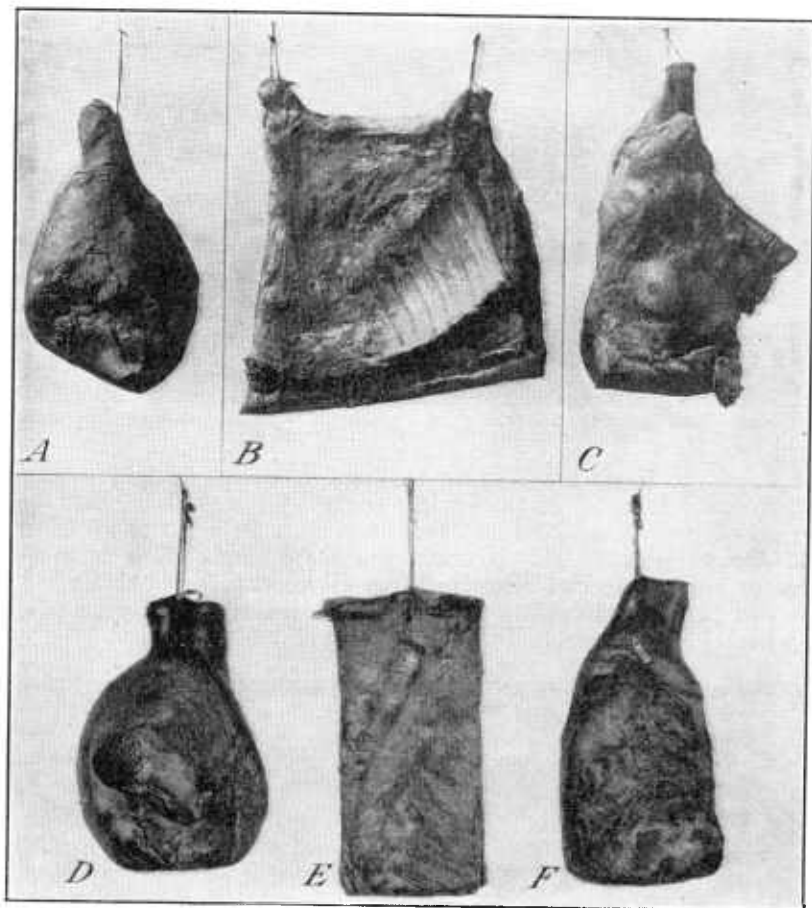


FIGURE 25.—Poorly trimmed ham (A), bacon (B), and shoulder (C). Similar cuts well-trimmed: D, E, and F.

paper or ordinary wrapping paper will not prevent undesirable drying. The wrapped fresh meat should be spread so that it will freeze quickly. When the packages are piled together in the locker it is often several days before the center of the pack reaches the desired temperature. Some trouble has been reported when the meat was piled to freeze.

Long storage periods sometimes result in undesirable drying of the exposed lean surfaces of frozen pork and the development of rancidity in the fat. Protecting the pork by proper wrapping and

by proper temperatures will tend to delay these developments although normally little trouble is encountered during the first month or so of storage. In general, farm families who use a freezer locker try to dress hogs periodically so that they can consume these limited quantities of frozen pork before it has been in storage more than 3 or 4 months.

Frozen pork is cooked with or without being thawed. Thawed or thawing pork is usually moist on the surface, thus affording ideal conditions for the growth of bacteria and mold. If the meat is to be thawed, it is desirable to thaw it in the refrigerator and to cook it promptly.

CURING PORK

Curing is a race between the multiplication of spoilage bacteria in the curing pork and the penetration of the preserving salt. It takes weeks for the salt to reach sufficient concentration to protect the center of hams and shoulders. Low temperatures are the best means known today to prevent the growth of spoilage organisms in meat until the salt has completed the task assigned to it.

In packing houses well-chilled pork cuts are cured at a temperature between 36° and 38° F. This appears to be the safest range of temperatures to use. At the same time much meat is cured on the farm at temperatures above 40° and even up to 50°, although much meat may be lost at these higher levels. The 36°–38° level throughout the curing period is the safest rather than the only one that can be used. This fact should be understood when ice-chilled curing boxes averaging 42°–48° temperatures are used.

Temperature levels are believed to influence flavor as well as soundness. Uniform temperatures normally result in a uniform saltiness and flavor development from microbial and chemical action.

CURING INGREDIENTS

SALT

Salt preserves and dries meat, but in excessive quantities will impair the flavor and make the lean muscles undesirably hard. Insufficient quantities will fail to check the development of putrefactive bacteria. A good grade of clean, common dairy or table salt is desirable.

SUGAR

Sugar is used mainly to lessen the harshness of the straight salt cure and to improve the flavor and texture of the meat. Brown or cane sugar may be used. Select the one that gives the desired flavor.

NITRATES

Saltpeter (nitrate of potash) preserves and dries the meat but is used almost entirely because it effectively fixes the bright-red color of the lean meat. Nitrate of soda (Chile saltpeter) is a little stronger, and 1.7 ounces of nitrate of soda will replace 2 ounces of saltpeter. The exact quantity of saltpeter or of nitrate of soda to be used should be weighed and mixed thoroughly in the curing mixture. It is undesirable and unnecessary to use more of either saltpeter or nitrate of soda than is recommended.

PEPPER

Pepper is sometimes dusted on the cured meat to add flavor.

SUGAR CURE

Most persons prefer the sugar cure to the plain salt cure. It can be applied by either the dry or brine method. The dry method is faster, so it is used almost exclusively in the South for hams and shoulders. Both methods are used for all cuts in colder climates. The brine method will produce a milder bacon than the ordinary dry cure.

BRINE METHOD

The standard curing mixture for each 100 pounds of meat is 8 pounds of salt, 2 pounds of sugar, 2 ounces of saltpeter, and $4\frac{1}{2}$ to 6 gallons of water.

Weigh the meat and put the measured or weighed water (8 pounds=1 gallon) into a crock or clean, well-soaked, odorless, hardwood barrel. Pour the curing ingredients into the water and stir until they dissolve.

CURING HAMS, SHOULDERS, AND BACON

If a salinometer is available use a little less water to dissolve the salt than is suggested. Then test the strong brine and dilute it to proper strength. The standard curing mixture dissolved in $4\frac{1}{2}$ gallons of water will make a brine that tests about 75° on the salinometer. This is excellent for curing hams and shoulders. When $5\frac{1}{2}$ gallons of water is used the weaker brine, testing 65° , will produce a desirable mild bacon.

If the brine is sterilized by boiling, it should be thoroughly cooled before being used. Under ideal conditions both the brine and meat will be at a temperature of about 38° F. when the pack is put down.

The chilled hams and shoulders are packed away, skin side down, in the crock or barrel. Fit them closely together, but take care not to squeeze them out of shape. Pour in the cold, 75° brine until the pack begins to shift or float a little. This movement permits the brine to come in contact with all parts of the meat. Then add a clean weight just heavy enough to keep the meat below the surface and cover the pack with brine.

Sometimes the shape of the curing vessel or the loose packing of the meat makes the estimated amount of brine insufficient to cover the meat. If it is impossible to pack the meat more closely add enough more brine to cover the pack.

On the fifth, fifteenth, and thirtieth days after being put down, the hams and shoulders should be overhauled; that is, they may be placed in another barrel and re-covered with the same brine, or they and the brine may be removed and then replaced in the same barrel. This overhauling remixes the brine and insures its coming in contact with all parts of each cut.

The bacon strips are usually packed skin side down, each piece being crosswise of the one below it. Jowls or shoulder butts may be used to fill any unoccupied spaces. The milder, 65° brine is frequently used for bacon. Overhauling this meat on the third and tenth days is usually sufficient.

CURING TIME

Hams and shoulders are generally held in brine 4 days per pound; that is, a 15-pound ham will not be removed from cure until the sixtieth day. It is probably better to allow the small 4- to 6-pound picnics 25 to 30 days in cure. Bacon can be cured in $1\frac{1}{2}$ to 2 days per pound.

A thin scum of white mold normally forms on top of the brine. If, however, the mold becomes heavy and hard or if the brine becomes ropy so that it drips from the fingers like sirup, the brine should be changed. Remove the meat, scrub it thoroughly with a brush and warm water, and repack it in a cleaned and scalded barrel. The new brine, made after the original recipe, should be diluted to as nearly the saltiness of the old brine as possible. If the hams and shoulders have been in cure a week, use 70° brine instead of 75° ; if more than 2 weeks, use 65° brine. Maintain the original curing schedule. This process may not save the meat, but it is the only course available.

CURING LOINS, SPARERIBS, AND OTHER CUTS

Often the quantity of loin, spareribs, backbone, and other fresh cuts at butchering time is greater than the family can use promptly and economically. These cuts can be preserved by curing as well as by canning and by freezing.

A mild 55° to 65° brine, which contains about 6 gallons of water, is best for the ribs. They can stand a light smoke after a week in cure but are acceptable without the smoking.

The loin may be given a light smoke after about 3 weeks in a 65° brine or may be used without being smoked.

Owing to the quantity of lean meat exposed, these cuts are likely to become dry and harsh if given a long cure or smoke. It will be more satisfactory to use the brine mainly as a means for storing them a short time. Keep the temperature of this meat as near 38° F. as possible while it is curing.

CURING MEAT IN SUMMER

Hogs may be slaughtered in the summer and the meat preserved if there is some way to chill it and keep it cold during the curing period.

DRY METHOD

For dry-curing hams and shoulders, there are many different recipes that call for varying quantities of salt. Five pounds for each 100 pounds of meat is generally sufficient if one is sure that all the salt will be absorbed by the meat. However, since some salt ordinarily falls off or drains away, 6 to 8 pounds is a safer quantity. In the South, where temperatures are often high, the 8 pounds of salt is probably better. More than this quantity should not be used as it may injure the flavor and make the lean meat too hard.

Meat is likely to spoil, regardless of the quantity of salt applied if the freshly slaughtered carcass and the curing meat are held at too high temperatures.

The following curing mixture is recommended: For each 100 pounds of trimmed pork use 6 to 8 pounds of salt, $1\frac{1}{2}$ to 2 pounds of

sugar, and 2 ounces of saltpeter. This is the well-known 8-2-2 recipe and is the same as that used in making the brine cure.

Mix the ingredients thoroughly in a pan and divide into two equal parts by weight. Use one part for the first rubbing, half of the remainder for overhauling the meat on the third day, and the other half for overhauling on the tenth day. In giving the first rubbing, sprinkle a little of the mixture in the bottom of the barrel. Put each ham and shoulder into the pan of curing mixture and rub it thoroughly. Force some salt into the hock and along the cut face of the butt, taking care not to injure the hand on the butt bone. Cover the face of the cut with the mixture and lay the piece carefully in place. Repeat the process in overhauling. The pieces at the top of the original pack should be at the bottom when the meat is resalted.

The same curing mixture, with the salt reduced to 5 pounds, will dry-cure 100 pounds of bacon. Overhauling on the third day will be sufficient.

In applying the curing mixture care must be taken to put the proper, or proportionate amount on each cut. For example, one-half of the 10 pounds of the 8-2-2 curing mixture makes 5 pounds that are to be used when 100 pounds of meat is first put in cure. Each 15-pound ham should receive 15 percent of that 5 pounds of mixture or three-fourths of a pound, each 20-pound ham 1 pound. Bacon strips are frequently oversalted, owing to their large surface in proportion to weight. With a little practice one can soon gage the approximate amount of mixture required by each piece.

Two days per pound is the standard curing time for the dry method. However, it is usually safer to keep 8- to 10-pound hams in the curing mixture for from 25 to 30 days. Farmers who wish to store this meat for summer use often remove the cuts at full time, string them, and allow them to hang for about 2 weeks before smoking them.

Fat backs and shoulder plates may be cured by either the dry or brine method. They are usually left in cure until used.

Pumping concentrated brine into curing meat, poking salt into ham joints, removing the aitch bone, opening the stifle joints and the shoulder joint, or boning and slicing entire cuts, are all variations of an effort to speed up the penetration of the salt. Where proper temperatures are available and the meat is in good condition these methods are unnecessary. Where temperatures are too high or the meat is not in good, sound condition, these methods may or may not prevent spoilage.

SMITHFIELD-STYLE HAM

A special type of cured ham is prepared in the South Atlantic States, oftentimes from hogs that have been partly fattened on peanuts. These hams, often known as Smithfield-style hams, are cured in a dry mixture for from 5 to 7 days, depending on their weight. They are then overhauled, resalted, and held in cure from 25 to 30 days (1½ days per pound). After the salt cure is completed they are washed in warm water, dried, sprinkled with pepper, and cold-smoked (70°-90° F.) for from 10 to 15 days, after which they are

aged and mellowed by hanging in a dry room for a period as long as 1 year.

PICKLED PIGS' FEET

In the preparation of pickled pigs' feet, special care must be taken to clean them thoroughly. The toes and dew claws should have been removed when the carcass was dressed. The glandular tissue between the toes should be trimmed out and all hair and dirt removed. Unless they are cared for properly, feet begin to spoil about as quickly as any part of the carcass; therefore, after thorough chilling they should be put in cure at once. The clean, chilled feet are usually put in the ham brine for from 15 days to 3 weeks and then cooked or simmered slowly until tender. Cook them slowly enough so that the skin will not part too badly and the feet pull out of shape. The cured, cooked feet are then thoroughly chilled and packed in cold, moderately strong (35-grain) vinegar, to which spices such as bay leaves or allspice may be added. The feet may be used at once or kept in the vinegar for 3 weeks or even longer.

Souse is made by cooking cured or uncured feet in a little water until the meat slips from the bones. The meat and strained soup in which the feet were cooked are then seasoned with vinegar and spice, brought to a boil, put in molds, and allowed to jell. Additional cooked pork trimmings may be added.

SMOKING CURED MEAT

Cured pork is smoked, primarily, to give the meat its familiar color and flavor and to evaporate some of the moisture from it. The small quantities of smoke products deposited on smoked meat also assist in sealing the surface and in delaying the development of rancidity in the fat. Relatively high smokehouse temperatures (110° F. or above) with a light smoke will speed up the drying; lower temperatures (80° to 110° F.) with a dense fog of smoke will intensify the smoky flavor in the meat. If the smoky flavor is not desired and the meat is not smoked, it should be hung up to dry until the dry-cured meat loses about 5 percent of its cured weight and the brine-cured meat loses about 10 percent.

Smoked, cured meat will have a brighter color and a milder flavor if it is freshened in cold water before being smoked. Hams and shoulders are soaked about 2 hours and bacon about 30 minutes. Most farmers do not soak the hams and shoulders that are to be stored for summer use.

All pieces to be smoked should be strung and scrubbed with warm water to remove the excess salt and grease. Hams and shoulders should be strung through the shank. Unless a regular stringing needle is at hand make an opening through the shank with the narrow blade of the boning knife and pull a stout string through with a wire loop (fig. 26). A wooden or wire skewer is usually run through the flank end of the bacon strip and the string inserted just below it (fig. 25, *E*). This keeps the piece square while it is hanging in smoke.

It is usually best to hang the cured, washed meat in the smokehouse overnight to drain and dry. Start the fire in the morning. If the

meat is still dripping when smoking begins the lower pieces will be streaked. Hang the meat so that no two pieces touch.

Cured pork may be smoked at a temperature of 100° to 120° F. The ventilators should be left open, especially at first, to permit the moisture to escape. A heavy fog of smoke is unnecessary. Continue the smoking until the meat has the desired color. Two days' smoking should give it a rich mahogany brown.

Meat that is to be aged or held for summer use is usually smoked more slowly. The temperature is held at 70° to 90° F. and the fires rebuilt intermittently over a period of from 1 to several weeks. This is as much a drying as a smoking process and is believed to assist

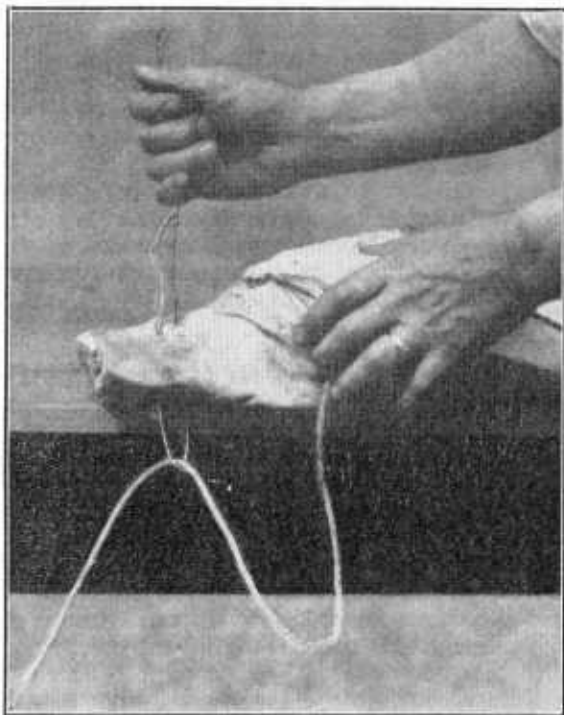


FIGURE 26.—Stringing a cured ham for smoking.

in preserving the meat and in the normal development of the mellow flavor characteristic of smoked pork that has been aged several months.

Smokehouse construction may vary from the barrel type to the elaborate six- or seven-story buildings used by commercial plants, but the general design of all is the same. There is a damper at the bottom to regulate the draft on the fire, enough distance from fire to meat to protect the meat from scorching, and a damper in the roof to permit the escape of evaporated moisture and to control the passage of the smoke past the meat.

A distance of 10 feet between meat and fire is safe. If the distance is only 5 or 6 feet, an inverted tub or metal shield should be placed above the fire to deflect the direct heat. A tight, preferably fireproof, building 6 feet wide, 6 feet long, and 8 feet high is a common type. Almost all cement or building-tile companies will supply plans for smokehouses, giving detailed directions for construction.

Green hickory wood and sawdust are the standard fuels for smoking meat, but almost any hardwood such as oak, apple, maple, or ash will be satisfactory. Where timber is scarce, corncocks may be used. Any resinous wood will blacken the meat and give it an undesirable flavor. If paper or pine shavings are used to kindle the green hardwood, be sure that all have been completely burned or removed from the fire before the smokehouse door is closed.

A fire built after the Indian fashion, with the sticks radiating from the center like the spokes of a wheel, will become lower and cooler as it burns. Building such a fire is a good precaution, for inattention to a hot fire has ruined the meat in many a smokehouse. Green sawdust may be used to deaden the blaze.

The use of liquid smoke, smoked salt, and like preparations intended to be applied to meat as a substitute for smoking, is prohibited in federally inspected packing houses.

TESTING SMOKED MEATS

Sourness in smoked pork can often be detected when the warm meat is removed from the smokehouse, and often a taint will be noticeable a week or two after smoking, but most of the meat that has safely reached this stage may be considered sound. A ham trier may be used to test each piece. This instrument resembles a narrow 10-inch harness awl. A length of stiff wire sharpened at one end may also be used. This trier is run along the bone to the center of the ham from both hock and loin ends. If the trier brings out a sweet odor, the meat is sound. If upon withdrawal the trier carries an unpleasant odor, the piece should be cut open and examined carefully for spoilage. If there is a definite odor of putrefaction, it is best to destroy the entire piece. Shoulders are tried in the shank, at the shoulder point, and under the bladebone.

WRAPPING AND STORING SMOKED MEATS

After the smoked meat has cooled, it is ready to be wrapped and stored. Wrapping protects the meat from insects and partially excludes the light and air that speed the development of rancidity in the fat. Many farmers rub pepper on the meat at this time to add flavor. Ground black pepper, with or without a little red pepper, may be used. The meat is then well covered with parchment paper and put into muslin bags. The paper wrapping should be heavy enough to keep the grease from soaking the bottom of the bag. The tops of the bags should be folded over and tied securely, a loop for hanging the meat being made in the outside tie string. Do not hang wrapped meat by the string that passes through the meat as insects may enter the package along the string. Each sack may be further protected by being painted with yellow wash, and then hung up for future use. In preparing the yellow wash, for 100 pounds of hams or bacon use the following: Three pounds of barium sulphate, 1 $\frac{1}{4}$ ounces of yellow ocher, 1 ounce of glue (dry), and 6 ounces of flour.

Fill a pail half full of water and mix in the flour, breaking up all lumps thoroughly. Mix the ocher in a quart of water in a separate vessel, add the glue, and pour them into the flour-and-water mixture. Bring this mixture to a boil and add the barium sulphate slowly, stirring constantly. Make the wash the day before it is required. Stir it frequently while using it and apply it with a brush. Lime, clay, flour, or a similar substance mixed with water to a rather thick consistency, may also be used to paint the bags.

The date for killing and curing should be planned if possible so that the smoked meat can be bagged or put in an insectproof place before the flies appear in the spring. Careful watch should be kept for insect infestation throughout the storage period.

If the meat has been properly cured and smoked it should store satisfactorily in a dry, dark, cool, well-ventilated place. Many farmers keep their hams and shoulders a year or longer until they have developed the mellow flavor characteristic of stored smoked pork.

In humid climates mold may develop very rapidly on the meat but usually can be rubbed or trimmed off without serious loss. Meat should be closely watched for evidence of mold penetration into the body of the meat. Once the mold works in between the muscles it injures the flavor of the meat.

The shrinkage of dry-cured hams and shoulders, just after being smoked, will range from about 8 to 15 percent of their fresh weight, and of brine-cured hams and shoulders, from 3 to 8 percent. At the end of 12 months' storage the shrinkage of either may reach 20 to 30 percent.

Bacon is usually more palatable when freshly cured and smoked. It does not store so well as hams and shoulders, and most farmers prefer to use it during the spring and early summer.

RENDERING LARD

Ordinarily the leaf fat, back fat, and fat trimmings are cooked together. The caul and ruffle fats from the internal organs yield a darker product than the other fats. If they have been removed carefully and washed and chilled promptly, they should have an acceptable odor and flavor.

Lard will render more rapidly and completely if the fat is cut into small pieces before being put into the kettle. Many persons prefer to grind it. Start cooking slowly with a small quantity of fat that can be stirred easily. When this fat has begun to melt add the remainder. The kettle should not be very full, or it may boil over. To prevent sticking and scorching, the fat should be stirred frequently and the fire watched during the entire cooking process.

At the beginning of the process, the temperature of rendering lard will be about 212° F. As the water contained in the fat tissues evaporates the temperature will rise slowly until it reaches 240° or 255°, which is as high as it should be allowed to go.

As rendering proceeds, the residual tissues (cracklings) will brown and float. When they are more nearly completely rendered they will gradually sink to the bottom. Care should be taken at this time to prevent small particles of cracklings from adhering to and scorching on the bottom of the kettle. Many persons stop the cooking when the cracklings are still floating. The more nearly complete rendering, however, removes a greater proportion of the moisture, thus producing lard that will be more likely to keep.

It is advisable to allow the rendered lard to settle and cool slightly before emptying the kettle. The liquid lard may be siphoned or dipped carefully into containers. The rest of the lard, containing the cracklings, is usually put through a press, the lard being strained through a screen covered with two or three thicknesses of cheesecloth. If the hot lard can be put into 5- or 10-pound containers and stored immediately at temperatures near or below freezing, it will chill rapidly enough to produce a fine grain.

Leaf fat will yield from 90 to 93 percent of its weight in rendered lard; a combination of leaf fat, back fat, and cutting fat, from

80 to 85 percent; and visceral fat, from 55 to 65 percent. Well-pressed cracklings derived from skinless fat from an average kettle will constitute 4 to 6 percent of the original weight of the fat.

STORING LARD

Air and light may cause a chemical change in stored lard which results in rancidity. For this reason the containers should be filled as nearly to the top as possible, sealed with a tight cover, and stored in a dark, cool place. Once the lard has become rancid, it is impossible to improve it.

If the moisture has been eliminated from the lard by a thorough rendering, no water-souring should develop during storage.

PREPARING SAUSAGE AND RELATED PRODUCTS

Sausage may be made one of the most desirable and appetizing of all pork products. Often the shoulder, bacon strip, and even the loin and hams are made into sausage along with the trimmings. There are many kinds of sausage, for each of which the seasoning may be varied to suit the individual taste. The few recipes included here are offered mainly as a guide. Desirable sausage can be made only from sound, high-quality materials. Care and accuracy in proportioning the ingredients are also essential.

The sausage grinder should be equipped with two combs or plates, having $\frac{1}{2}$ - and $\frac{1}{8}$ -inch holes, respectively. A small hand stuffer will be convenient.

Fresh pork sausage, and headcheese, may be used without being stuffed, but sausages similar to liver sausage and Bologna-style sausage should be stuffed in casings. Bundles or sets of salted casings may be purchased from almost any butcher. Several types of manufactured casings are also on the market. Animal casings should be soaked for several minutes in warm water and then flushed out immediately before being used. Sausage may be stuffed in muslin bags. After being scrubbed and chilled, the stuffed bags are usually dipped in paraffin.

In stuffing, force enough sausage into the stuffer attachment to fill it. Slip as much soaked casing over the attachment as it will hold. If muslin casing is used, pull the closed end of the casing up tightly against the end of the stuffing tube. These precautions prevent the formation of air pockets in the sausage.

The operator supports the casing at the end of the stuffer with the first finger of his left hand while he turns the crank with his right hand. Pressing upward with the left forefinger and raising the stuffed casing above the end of the stuffer will pack the casing more tightly, thereby keeping out air pockets. Animal casings are cut after the proper-sized ring or length has been stuffed and a new length is then begun.

To tie the casings, drive a tenpenny nail into the far corner of the table and fasten to it one end of a stout, soft, white string 3 feet long. Grasp both cut ends of the casing, for example, a ring of liver sausage, in the left hand and tie them together with two half hitches of the string. Tie the first ring near the nail and each

succeeding one a little farther down the string. When the string is full, cut it free and attach a new one.

FRESH SAUSAGE

The fresh trimmings from which pork sausage is made should be about one-third fat and two-thirds lean. If more fat is included, the sausage may be too rich and will have a large cooking loss. Less fat will make the cooked patties rather hard and dry and difficult to brown.

In making a small quantity of sausage to test the recipe, the following measurements may be used:

- 4 pounds trimmings.
- 5 level teaspoons salt.
- 4 level teaspoons ground sage.
- 2 level teaspoons ground pepper.
- $\frac{1}{2}$ level teaspoon ground cloves or
- 1 level teaspoon ground nutmeg (if desired).
- 1 teaspoon sugar.

For 100 pounds of trimmings use the following:

- $1\frac{3}{4}$ pounds salt.
- 2 to 4 ounces ground sage.
- 2 to 4 ounces ground pepper.
- $\frac{1}{2}$ to 1 ounce red pepper (if desired).
- $\frac{1}{2}$ to 1 ounce ground cloves, or
- 1 ounce ground nutmeg (if desired).
- 12 ounces of sugar may also be included if the sausage is to be used reasonably soon.

The seasoning should be well mixed, spread over the trimmings, and the whole quantity ground through the fine plate. Some persons prefer to grind the unseasoned meat through a plate with $\frac{1}{2}$ -inch holes and then mix it with the spices and regrind through a plate with $\frac{1}{8}$ -inch holes.

If the sausage is to be put into casings it should be stuffed immediately after grinding. It should then be soft enough to pack tightly in the casings without the addition of cold water. It may also be fried down or canned.

To make bulk sausage that will slice and fry without crumbling, add a scant half cup of cold water to each 4 pounds of ground seasoned sausage and knead with the hands until the meat becomes very sticky and doughlike. Pack tightly in small molds or pans and allow it to chill before slicing.

SMOKED SAUSAGE

Use pork sausage made with 2 pounds of salt, instead of $1\frac{3}{4}$ pounds, per 100 pounds of trimmings. If it is too stiff to stuff properly, add from 3 to 5 percent of cold water and knead until the mass becomes doughlike. Stuff tightly in casings and allow it to cure for about 24 hours in a cool place. Smoke and dry at a temperature of 70° to 90° F. for a day or two until a dark mahogany color is obtained. This sausage should not be kept until hot weather unless it is canned.

BOLOGNA-STYLE SAUSAGE

Bologna-style sausage consists of ground pork and beef mixed with enough water to give the sausage the desirable fine, tenacious texture. Commercial concerns sometimes grind warm beef from freshly slaughtered cattle with cracked ice because this method gives a still finer grain to the finished product.

One standard recipe for Bologna-style sausage is as follows:

- 60 pounds beef.
- 40 pounds pork trimmings.
- 20 pounds cold water.
- 2 to 2½ pounds salt.
- 1 ounce saltpeter.
- 2 to 4 ounces black pepper.
- 1 to 1½ ounces coriander.
- 1 ounce mace.
- Onions (if desired).

Grind the chilled beef trimmings with salt at the rate of 2 pounds per 100 pounds of beef. Use the coarse grinding plate, and allow the meat to cure in a cool place for about 48 hours. Salt, in the same proportion, is added to the coarsely ground pork the next evening and the pork is allowed to cure overnight. Many persons do not cure the pork.

Regrind the cured beef, using the plate with ⅛-inch holes. Then add the pork and grind the mixture again. If the pork was not cured add the salt (13 ounces for each 40 pounds of pork) before grinding. Add the spices and the water and stir or mix vigorously until the whole mass has become sticky. It often takes 30 minutes to mix this sausage properly.

Stuff the sausage tightly into beef casings or muslin bags and allow it to hang and cure in a cool place until the next morning. Put it in a well-ventilated smokehouse heated to 110° to 120° F. Protect the casings from a direct blaze that might scorch them. The sausage should take on a rich mahogany brown in about 2 hours' smoking.

Put the hot, freshly smoked sausage immediately into water heated to 160° to 175° F., and cook it until it squeaks when the pressure of the thumb and finger on the casings is suddenly released. The usual cooking time for sausage stuffed in beef "rounds" is 15 to 30 minutes; for larger casings 60 to 90 minutes. Plunge the cooked sausage into cold water and chill it. Hang it in a cool place.

COOKED PRODUCTS

Cooking is a convenient means of preparing the edible parts of cuts that are difficult to bone, such as the head, feet, and tail. It is also a means of utilizing miscellaneous pieces of trimmings, liver, heart, tongue, and the soup in which the meat has been cooked.

All meat should be well trimmed and washed before being cooked. The teeth, nasal passages, eyes, and eardrums should be removed. If the lips, snout, and ears have been well cleaned, they may be included. The jowl is usually cut off and cured. It may be added but will often cause the headcheese and scrapple to be too fat.

The feet should be well shaved and cleaned and the glandular tissue between the toes trimmed out.

HEADCHEESE

Headcheese is easily made. Make deep cuts in the jowls or other thick pieces of meat, cover with water, and simmer until the meat is well done and slips easily from the bones. The skin, if used, should be cooked in a net or sack so that it may be removed when so tender that a finger can be pushed through it. The thick ears and snouts will require longer cooking than the other skin. The skin is ground with the plate having $\frac{1}{8}$ -inch holes. The jowls and other pieces are boned after being cooked. These, with the boneless pieces such as the heart, are ground with a plate that has $\frac{1}{2}$ -inch holes. Some persons prefer to cut the tongue and some of the larger pieces of fat into strips instead of grinding them.

The finely ground skin and coarsely ground pieces are then mixed with enough of the soup—the water in which the meat was cooked—to make the mass soft without being sloppy. This mixture is returned to the kettle and brought to a boil. This reheating serves to mix the gelatin thoroughly through the soup so that when the headcheese is poured into shallow pans and chilled it will slice without crumbling.

Seasoning is added at the beginning of the second cooking. Usually it is safe to season to taste though the following quantities of seasoning per 100 pounds of cooked meat, including the added soup, are a satisfactory guide:

- 2 to $2\frac{1}{2}$ pounds salt.
- 3 to 5 ounces black pepper.
- $\frac{1}{4}$ to 1 ounce red pepper (if desired).
- 1 ounce ground cloves (if desired).
- 1 ounce coriander (if desired).
- 2 ounces sweet marjoram (if desired).

If headcheese is stuffed into casings, it should be seasoned and stuffed before the second cooking. The stuffed headcheese should then be replaced in the remaining soup and simmered until it floats. This will require from 10 to 30 minutes. It is then chilled in cold water and stored in a clean, cool place.

Headcheese is usually eaten cold, sometimes with vinegar.

LIVER SAUSAGE

Cook heads, tongues, skins, hearts, and other pieces as for headcheese, but for a shorter period. Remove from the fire when the cuts can be boned. Scald the livers last. If they are deeply cut with a knife they should be sufficiently seared in about 10 minutes. Liver adds a definite flavor to this sausage; 10 to 20 percent of liver, by weight, is usually added to the other cooked products.

Grind all the cooked materials moderately fine and add about one-fifth as much soup by weight, using enough soup to make the mixture soft but not sloppy. Season to taste and mix thoroughly. The following are standard quantities of seasonings for 100 pounds of the mixture:

- 2 to $2\frac{1}{2}$ pounds salt.
- 2 to 4 ounces black pepper.
- 1 to 3 ounces sage (if desired).
- $\frac{1}{4}$ to 1 ounce red pepper (if desired).
- 1 to 2 ounces allspice (if desired).

The seasoned, well-mixed sausage is usually stuffed in beef casings and simmered in water until it floats; usually the time required is 10 to 30 minutes. After being cooked, the sausage is plunged into cold water, chilled for at least 30 minutes, and hung up to drain.

If the meat is cooked too much in the first kettle, the second cooking, after the sausage has been stuffed, will destroy the tight "live" texture of the finished sausage.

SCRAPPLE

Scrapple, an especially favored breakfast dish in many sections, is composed of cooked pork and soup thickened with corn meal, flour, and sometimes shorts.

Cook the heads, hearts, and trimmings as for liver sausage, or until the bones can be removed. Cook the skin, if used, until tender. Grind all the material through the fine plate. Return all the ground material to the soup after it has been strained to remove the bones, and bring it to a boil.

The cereal mixture to be added may vary widely. One consisting of 7 parts corn meal and 3 parts white or buckwheat flour or 7 parts corn meal, 2 parts shorts, and 1 part buckwheat flour, should be acceptable.

Four parts ground cooked meat products, 3 parts soup, and 1 part dry cereal mixture (by weight) will produce a richly flavored, satisfactory scrapple. More meal and soup may be used if desired.

In adding the cereal mixture, moisten it with some of the cooled soup so that it may be added to the hot soup without forming lumps. Boil it for about one-half hour, stirring it frequently or constantly to prevent sticking. Add the seasoning shortly before the cooking is finished and stir it in well.

The following seasonings may be used for 100 pounds of scrapple, including the soup and the dry cereal mixture:

- 2 to 2½ pounds salt.
- 2 to 4 ounces black pepper.
- 2 to 4 ounces sweet marjoram.
- 2 to 4 ounces sage (if desired).
- 1 ounce red pepper (if desired).
- 1 ounce nutmeg (if desired).
- ½ ounce mace (if desired).
- 2 pounds ground onions during second cooking (if desired).

The hot scrapple is poured into small shallow pans and chilled as promptly as possible. If properly made, it can be sliced and fried quickly without much crumbling. The slices may be dipped in egg before they are fried.

PANHAS

The soup remaining after the making of headcheese or liver sausage may be used to make a kind of corn-meal mush called panhas. Strain out all bones, bring the soup to a boil, and add the meal slowly. A safe method of preventing the formation of lumps is to moisten the meal beforehand with a little cooled soup, adding enough of the liquor to make a thick paste.

Three or four parts of soup to one part of meal, by volume, is a good proportion. Season to taste with the seasonings given for head-

cheese. Cook the meal 30 to 45 minutes and pour it into shallow pans to cool. Slice and serve like scrapple.

CANNING PORK ²

Pork may be canned successfully in the home, provided it is processed under steam pressure. The temperatures required for effective sterilization (240° to 250° F., corresponding to 10 and 15 pounds steam pressure) cannot be obtained inside the can or jar except by the use of the steam pressure canner. The water bath, the oven, and the steamer without pressure are inadequate for canning pork and cannot be used safely. If a pressure canner is not available, other methods of preservation should be used.

All pork for canning should be clean and sound. Unless the pork is to be canned at once, chilling the carcass after slaughtering is necessary. Chilling makes little difference in the flavor or tenderness of the canned product. Chilling is recommended, however, as raw meat is easier to handle after chilling, may be held for a few days until it is convenient to can it, and there is less danger of spoilage if canning is unexpectedly delayed.

TYPES OF CONTAINERS

The most desirable utensils for the preparation of meat for canning are preferably enamelware, aluminum, tin, or other stainless metal. Meat should not be allowed to remain in contact with galvanized iron more than about 30 minutes, or it may take up harmful quantities of zinc. Wooden utensils or surfaces require special care in cleaning to free them from bacteria. They should be scrubbed with soapy water to remove all grease and then thoroughly rinsed with boiling water. If used for several days at a time they should be disinfected with a hypochlorite solution (calcium, potassium, or sodium hypochlorite) applied after the scrubbing and scalding.

Plain tin cans and glass jars are used for the home canning of pork.

In canning meat the head space (space at the top of the can) is particularly important. If the liquid does not cover the meat, it will discolor and lose flavor during storage. In packing containers allow the following head space: Glass jars, one-half inch; No. 1 tin cans, one-fourth inch; No. 2 tin cans, five-sixteenths inch; No. 3 tin cans, three-eighths inch.

The sizes of containers most suitable for meat products are No. 2 and No. 2½ tin cans, and pint glass jars. The No. 3 tin cans (quart) and quart glass jars require much heavier processing, and though times are given for them in table 1, their use is not recommended.

² This information concerning the preservation of pork by canning is from Farmers' Bulletin 1762, Home Canning of Fruits, Vegetables, and Meats, prepared by the Bureau of Home Economics, U. S. Department of Agriculture. More detailed directions for the canning of pork may be obtained from the Bureau of Home Economics.

TABLE 1.—*Timetable for processing pork in various containers in the steam pressure canner at 250° F., or 15 pounds pressure*¹

Product	No. 2 can	No. 2½ can	No. 3 can	Pint glass jar	Quart glass jar
	<i>Minutes</i>	<i>Minutes</i>	<i>Minutes</i>	<i>Minutes</i>	<i>Minutes</i>
Fresh pork.....	85	110	120	85	120
Headcheese.....	90	-----	-----	90	-----
Liver paste.....	90	-----	-----	90	-----
Sausage.....	90	115	-----	90	120

¹ At altitudes over 2,000 feet, add 1 pound of pressure for each additional 2,000 feet. After processing, cool tin cans at once in cold water. Better results are obtained by canning pork in No. 2 and No. 2½ cans or pint glass jars rather than in No. 3 cans or quart glass jars.

When glass jars are used, pork should be precooked in the oven or in water before being packed in the container. When tin cans are used, the meat may be precooked in either of these ways and packed hot, or it may be packed raw and the cans exhausted before being sealed. The latter method gives a little better flavored product, and the liquid is all meat juice; but it takes more time and stove space. Frying is not recommended as a method of precooking meat for canning, because it makes the meat hard and dry and may give it a disagreeable flavor.

PARTS BEST SUITED TO CANNING

In the preparation of pork for canning it is especially important to trim off practically all the fat. When much fat is canned with the lean meat it causes correspondingly greater shrinkage during processing as the fat melts. The fat may also interfere with the destruction of bacteria and make the canned product more likely to spoil. Cuts of pork that contain rather large proportions of fat are more economically preserved by curing because of the heavy trimming and shrinkage they undergo in canning. The parts of pork usually canned are: Loin, meat from spareribs; head, tongue, and heart in headcheese; loin and lean trimmings in sausage; and liver in liver paste. Hams and shoulders may be canned, but they are generally cured.

Salt is added as follows: One-half teaspoon to a pint jar, three-fourths teaspoon to a No. 2 or No. 2½ can, and 1 teaspoon to a quart jar or No. 3 can. When tin cans are used, place the salt in the cans before packing them with meat.

FRESH PORK

Remove excess fat from the meat to be canned and precook the meat by any of the methods described on page 36. Pack hot and process as directed in table 1.

HEADCHEESE

Prepare headcheese as directed on page 32. No sage should be used as it may become bitter after canning. Pack the headcheese hot into containers and process as directed in table 1. It is better to use tin cans so that when the can is opened the product may be removed in a single piece.

PORK LIVER PASTE

Pork liver may be canned as liver paste, which is made as follows:

3 pounds liver.	1 medium-sized onion, chopped.
1½ pounds fat fresh pork.	3 eggs.
2 tablespoons salt.	6 tablespoons fine dry bread crumbs.
1 teaspoon white pepper.	½ cup water.
½ teaspoon ground cloves.	

Wash the liver thoroughly and remove veins and tough membranes. Grind the raw liver and pork twice through a plate with ⅛-inch holes, to make it very smooth. Add the seasonings. Beat the eggs well and combine with the bread crumbs and water. Stir all ingredients together until well-mixed. Pack into No. 2 cans, leaving 1 inch of head space, and exhaust until the paste is heated through to the center of the cans. This requires about 40 to 50 minutes. Remove some of the paste or add a little hot water if necessary so that the cans have the proper head space before sealing. Process as directed in table 1.

PORK SAUSAGE

Prepare the sausage as directed on page 30, but omit the sage because it gives the sausage a bitter flavor after processing. See that the seasonings and meat are well-mixed together.

If using tin cans, pack the raw sausage closely into the No. 2 size and exhaust the cans until the sausage is steaming hot. This requires 40 to 50 minutes. Process as directed in table 1. Before opening a can, heat it for a few minutes in boiling water, then slip the contents of the can out in one piece, slice into rounds, and reheat in gravy or in an oven.

If glass jars are used, mold the sausage into cakes and precook in a moderate oven (350° F.) for 10 to 15 minutes, or until the cakes are slightly browned and the color of raw meat has almost disappeared. Pack into the jars and cover with the drippings or with hot water. Process as directed in table 1.

PRECOOKING IN WATER

Cut the meat into uniform pieces weighing about 1 pound and place them in boiling water. Partly cover the kettle and simmer for 12 to 20 minutes, until the color of the raw meat has almost disappeared from the center of the pieces. At this stage the meat has lost about one-third of its original weight, as some of the juice has cooked out. Cut the meat into smaller pieces immediately, pack it into the containers, and press it down closely with a wooden mallet or pestle. Cover with the broth, leaving proper head space, and process immediately. This method, commonly referred to as parboiling, is the quickest way to precook a large quantity of meat.

PRECOOKING IN TIN CANS

Precooking should never be attempted with glass jars because of danger of breakage. Pack two or more pieces of meat into each can, and place the filled but open cans in a bath of boiling water that comes to within 1½ to 2 inches of the top of the can. Cover the bath to hold in steam and heat, being careful that water from the bath

does not bubble into the cans. Continue heating until the meat is steaming hot, or 170° F., at the center of the cans, and has practically lost its raw color. If no thermometer is available, turn out the meat from a few of the cans to be sure it is heated through. The time required is about 40 to 50 minutes for No. 2 cans. Press the meat down and be sure it is covered with broth and that there is proper head space in the cans. Seal at once and process immediately.

PRECOOKING IN THE OVEN

Cut the meat into uniform pieces weighing about 1 pound each, and cook in a moderate oven (350° F.) until the raw color of the meat almost disappears at the center. This requires about 30 to 40 minutes. Cut the meat so that there are two or more pieces to each container, to facilitate heat penetration, pack at once closely, cover with pan drippings or with boiling water, leaving proper head space, and process immediately.

REGULATIONS FOR SHIPPING MEAT OR MEAT FOOD PRODUCTS

Farmers who ship their meats must comply with official State and Federal regulations. Below is shown a sample shipper's certificate such as must be used in interstate shipments of uninspected meat or meat food products which are from animals slaughtered by the farmer on the farm. Blank certificates should follow this sample. In size the certificate should be 5½ by 8 inches.

Shipper's Certificate

Date _____, 19__.

Name of carrier _____

Shipper _____

Point of shipment _____

Consignee _____

Destination _____

I hereby certify that the following-described uninspected meat or meat food products are from animals slaughtered by a farmer on the farm, and are offered for transportation in interstate or foreign commerce as exempted from inspection according to the act of Congress of June 30, 1906, and at this date they are sound, healthful, wholesome, and fit for human food, and contain no preservative or coloring matter or other substance prohibited by the regulations of the Secretary of Agriculture governing meat inspection.

Amount and weight.

Kind of product _____

(Signature of shipper)

(Address of shipper)

Two copies of this form are to be presented to the common carrier with each shipment.

COOK PORK THOROUGHLY

Man may become infected with a very serious disease called trichinosis through the eating of raw pork. This disease is caused by parasites called trichinae, which are too small to be seen by the naked eye but may be present in the lean meat of hogs. The danger of trichinosis may be entirely avoided by cooking pork thoroughly.

Trichinosis may be contracted from tasting sausage during its preparation to determine when seasoning is satisfactory, from hastily cooked hamburgers that contain some pork, from imperfectly cooked fresh pork, and sausage, smoked hams, bacon, and shoulders, and from improperly prepared ready-to-eat products such as Bologna-style sausage, boneless loins, capocollo, coppa, dry or summer sausage, and Italian-style ham. When these latter products are eaten without further cooking in the home, one must be sure that they have been made in a plant where competent official inspection has insured a treatment of the pork muscle that will destroy possible live trichinae.

COOK PORK THOROUGHLY